

## WHAT IS CLAIMED IS:

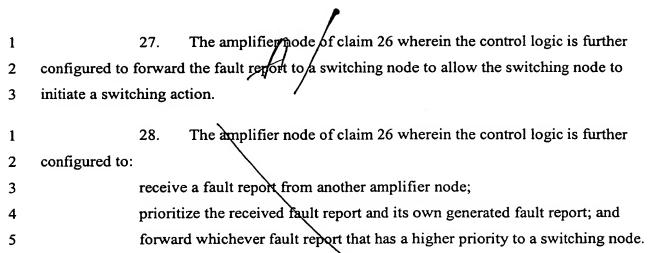
directional line switched ring network.

1. A system for detecting faults in an optical network, comprising:
a first node and a second node; and
an amplifier node coupled between the first node and the second node, the
amplifier node configured to detect a fault on an optical link connecting the amplifier node
and the first node and generate a fault report upon detection of the fault, the amplifier node is
further configured to forward the fault report to the second node.
2. The system according to claim 1 wherein upon receiving the fault
report from the amplifier node, if the second node is capable of switching traffic, the second
node initiates a switching action to restore traffic between the first node and the second node;
and if the second node is not capable of switching traffic, the second node forwards the fault
report to a third node.
3. The system according to claim 2 wherein the fault report is forwarded
until the fault report is received by a node which is capable of switching traffic.
4. The system according to claim 1 wherein the second node is capable of
switching traffic and is configured to:
detect a fault on an optical link carrying optical signals into the second node;
and
upon receipt of the fault report from the amplifier node, prioritize the fault
report and the fault detected by the second node.
5. The system according to claim 1 wherein the amplifier node is further
configured to receive and pass a fault report from another amplifier node to the second node.
6. The system according to claim 1 wherein the amplifier node is
configured to:
receive a fault report from another amplifier node;
prioritize the received fault report and the generated fault report; and
forward whichever fault report that has a higher priority to the second node.
7 The system according to claim 1 wherein the optical network is a bi-

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1	8. The system according to claim 1 wherein the fault on the optical link is
2	detected based on a loss-of-signal condition.
1	The system according to claim 8 wherein the amplifier node
2	comprises:
3	an input signal power detector configured to monitor input power of the
4	optical link; and
5	control logic configured to evaluate output from the input signal power
6	detector to determine if the loss-of-signal condition exists.
1	10. A method for detecting faults in an optical network having an amplifier
2	node coupled between a first node and a second node, comprising:
3	detecting a loss of-signal condition on an optical link carrying optical signals
4	from the first node to the amplifier node;
5	causing the amplifier node to generate a fault report reporting occurrence of
6	the loss-of-signal condition; and
7	forwarding the fault report to the second node.
1	11. The method of claim 10 further comprising:
2	if the second node is capable of switching traffic, causing the second node to
3	initiate a switching action to restore traffic between the first node and the second node; and
4	if the second node is not capable of switching traffic, forwarding the fault
5	report from the second node to another node.
1	12. The method of claim 11 further comprising:
2	forwarding the fault report until the fault report is received by a node which is
3	capable of switching traffic.
1	13. The method of claim 10 further comprising:
2	if the second node is capable of switching traffic, detecting a fault on an
3	optical link carrying optical signals into the second node and upon receipt of the fault report
4	from the amplifier node, prioritizing the fault report and the fault detected by the second
5	node.
1	14 The method of claim 10 further comprising:

2	causing the amplifier node to receive and pass a fault report from another
3	amplifier node to the second node.
1	15. The method of claim 10 further comprising:
2	causing the amplifier node to receive a fault report from another amplifier
3	node;
4	prioritizing the received fault report and the generated fault report; and
5	forwarding whichever fault report that has a higher priority to the second
6	node.
1	16. The method of claim 10 wherein the optical network is a bi-directional
2	line switched ring network.
1	17. An optical network comprising:
2	a plurality of switching nodes connected to one another, at least one switching
3	node capable of switching traffic; and
4	a plurality of amplifier nodes;
5	wherein:
6	at least one amplifier node is coupled between selective pairs of
7	switching nodes; and
8	the least one amplifier node is configured to detect a fault on an
9	incoming optical link carrying optical signals into that amplifier node, generate a fault report
10	upon detection of the fault, and forward the fault report to a neighboring node.
1	18. The optical network of claim 17 wherein:
2	upon receiving the fault report, if the neighboring node is a switching node,
3	the neighboring node initiates a switching action to restore traffic; and if the neighboring
4	node is not a switching node, the neighboring node forwards the fault report to another node.
1	19. The optical network of claim \ 18 wherein the fault report is forwarded
2	until the fault report is received by a switching node.
1	20. The optical network of claim 17 wherein the at least one switching
2	node is configured to:
3	detect a fault on an incoming optical link carrying optical signals into that
4 ,	switching node; and

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5	upon receipt of a fault report from an amplifier node, prioritize the received
6	fault report and the fault detected by that switching node.
1	21.\ The optical network of claim 17 wherein the at least one amplifier
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2	node is further configured to receive and pass a fault report from another amplifier node to a
3	switching node.
1	The optical network of claim 17 wherein the at least one amplifier
2	node is configured to:
3	receive a fault report from another amplifier node;
4	prioritize the received fault report and the generated fault report; and
5	forward whichever fault report that has a higher priority to the neighboring
6	node.
1	23. The optical network of claim 17 wherein the optical network is a bi-
2	directional line switched ring network.
2	directional line switched ling network.
1	24. The optical network of claim 17 wherein the fault on the incoming
2	optical link is detected based on a loss-of-signal condition.
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1	25. The optical network of claim 24 wherein the at least one amplifier
2	an input signal power detector configured to monitor input power of the
3	incoming optical link; and
5	control logic configured to evaluate output from the input signal power
6	detector to determine if the loss-of-signal condition exists.
U	detector to determine it the loss-or-signal conduction exists.
1	26. An amplifier node for use in an optical network, comprising:
2	an input signal power detector configured to monitor input power of an
3	incoming optical link received by the amplifier node, and
4	control logic configured to:
5	evaluate output from the signal power detector to determine if a loss-
6	of-signal condition thereby indicating a fault on the incoming optical link; and
7	generate a fault report reporting the loss-of-signal condition.



1 29. The amplifier node of claim 26 wherein the optical network is a bi-2 directional line switched ring network.